

THIS REPORT HAS BEEN DELIMITED
AND CLEARED FOR PUBLIC RELEASE
UNDER DOD DIRECTIVE 5200.20 AND
NO RESTRICTIONS ARE IMPOSED UPON
ITS USE AND DISCLOSURE.

DISTRIBUTION STATEMENT A

APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED.

UNCLASSIFIED

AD_ 4 4 3 0 0 2

DEFENSE DOCUMENTATION CENTER

FOR

SCIENTIFIC AND TECHNICAL INFORMATION

CAMERON STATION ALEXANDRIA, VIRGINIA



UNCLASSIFIED

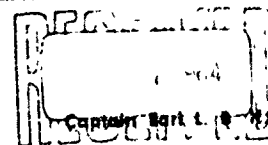
NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

443002

FILE COPY

**FEASIBILITY
AND
DESIRABILITY OF
THE USE
OF INCENTIVES
TO IMPROVE
ECONOMIES
IN
ORGANIC
MAINTENANCE
OPERATIONS**

A STUDENT THESIS D.C.



Capt. Earl L. Hamilton, USAF
EDC:MA

**SCHOOL OF SYSTEMS AND LOGISTICS
AIR FORCE INSTITUTE OF TECHNOLOGY
WRIGHT-PATTERSON AIR FORCE BASE, OHIO**

⑪ AFIT-SSL

⑪ SLSR-7-64
JE

⑥

FEASIBILITY AND DESIRABILITY OF THE USE OF INCENTIVES

TO

IMPROVE ECONOMIES IN ORGANIC MAINTENANCE OPERATIONS,

THESIS

1st Lt. Patton - HFB

~~Presented to the Faculty of the School of Systems and Logistics~~

⑤ → ~~of the Air Force Institute of Technology~~

Air University

in Partial Fulfillment of the

Requirements for the Degree

of Master of Science

in Logistics Management

By

Earl L. B. Hamilton, B.S.

Captain

USAF

Graduate Logistics

⑪ → June 1964

ACKNOWLEDGEMENTS

The writer of this thesis is indebted to many persons for their aid during the process of research and writing. The cooperative attitude and response to interviews on the part of persons visited were major contributions to the validity of this research.

For criticism and suggestions, I am indebted to Dr. Herbert Kroeker and Mr. William Berkeley, of the Ohio State University, and especially to Major Ivan Thompson, USAF, School of Systems and Logistics, Air Force Institute of Technology.

To Miss Anne Ruth McMillan, I would like to add my appreciation for her assistance in the typing of the many drafts necessary to complete this project, and in the preparation of the final manuscript. Her editorial services have been invaluable.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
LIST OF TABLES	iv
Chapter	
I. INTRODUCTION	1
The Incentive Contract	
The Purpose	
Methodology Used in the Study	
Summary	
II. CONCEPTS AND PHILOSOPHY FOR AN INCENTIVE PROGRAM	9
Incentive Concepts and Philosophy	
Incentive Compensation for Supervisors	
Executive Incentive Compensation Plans	
Summary	
III. USAF INCENTIVE APPLICATION	25
Development of an Incentive Program	
USAF Sponsored Programs	
Summary	
IV. CONCLUSIONS	41
BIBLIOGRAPHY	47

LIST OF TABLES

Table	Page
1. Federal Administrative Budget Expenditures for National Defense Functions	2
2. Unit Cost History--C/KC 135 Aircraft Procured from the Boeing Company's Transport Division	5
3. Computation of Awards--Award Scale for Tangible Benefits	33
4. Intangible Scale for Suggestions, Special Acts, or Services	34
5. Military Suggestion Program Awards	35
6. Annual Air Force Wide Military Suggestion Contest	36
7. Intangible Scale for Sustained Superior Performance	37

CHAPTER I

INTRODUCTION

The need for greater efficiency and economy in government operations was expressed by former President Kennedy in his 1963 Budget Message to Congress:

In our society, Government expects continuing scrutiny and criticism of its efficiency. The search for greater efficiency is never finished. What was an efficient practice a few years ago may be obsolete today. New approaches to work practices, to information handling, and even to decision making itself are the order of the day throughout government as well as private industry.¹

The magnitude of increasing costs for operation of the Department of Defense, expressed in terms of budgetary requirements, are stated in Table 1.

It is noted in Table 1 that the U.S. Administrative Budget has increased from \$64 billion in 1955 to \$98 billion (est.) in 1964, an increase of over \$34 billion in 9 years. During the same period of time, the Defense Budget has increased from a low of \$40 billion in 1955, to \$55 billion (est.) in 1964, for an increase of \$15 billion during the same period. Thus, the defense requirements have accounted for approximately 44% of the increase in the Administrative Budget during the past 10 years. This has created the need to investigate ways and means to improve the efficiency of operation in the Department of Defense.

¹U.S., Congressional Record, 88th Cong., 1st Sess., 17 January 1963, House Vol. 109 No. 6, p. 487.

TABLE 1

**FEDERAL ADMINISTRATIVE BUDGET EXPENDITURES FOR NATIONAL
DEFENSE FUNCTIONS (MILLIONS OF DOLLARS)^a**

Fiscal Year	Administrative Budget Expenditure	National Defense	% of Total
1954	67,537	46,986	69.6
1955	64,389	40,695	63.2
1956	66,224	40,723	61.5
1957	68,966	43,360	62.9
1958	71,369	44,234	62.0
1959	80,342	46,491	57.9
1960	76,539	45,691	59.7
1961	81,515	47,494	58.3
1962	87,767	51,103	58.2
1963	94,313	53,004	56.2
1964 (est.)	98,802	55,433	56.1

^aStatistical Abstract of the United States 1963, National Data Book and Guide to Sources, 84th Edition, Table #334.

A highly significant portion of Defense expenditure is required for materiel maintenance. For example, from FY 1953 through FY 1963, \$156 billion was spent for procurement of new weapons systems while \$109 billion was spent for operation and maintenance of existing systems.² The severity of these rising costs for Department of Defense operation led to direct intervention by former President Kennedy to control these costs. As a result, the President gave two instructions to Secretary of Defense McNamara:

1. Develop a force structure necessary to the military requirements without regard to arbitrary budget ceilings.

²Charles J. Hitch, "What Tying Dollars to Military Decision Means to Defense Management," Armed Forces Management, Vol. IX, (November 1963), p. 97.

2. Procure and operate this force at the lowest possible cost.

Secretary of Defense McNamara, in his July 1962 memorandum to the President, gave the following report:

The steps we have taken in accordance with your first instruction have strengthened our strategic nuclear forces, have balanced them with non-nuclear forces capable of meeting challenges to our national interest in any part of the world, and have created a new kind of force that can deal with the special challenge of subversion and guerrilla warfare.

The extent of these changes has underlined the importance of your second instruction. We have moved on several fronts to carry out this instruction as well.

.....

Third, we are giving intense scrutiny to our procurement and logistics policies since seventy percent of every defense dollar is spent on purchasing, construction, operating depots and bases, maintenance, transportation and communication services.

Based on the actions we have taken to date and those we contemplate for the future, I can report to you that within five years we can cut the cost of the Department's logistical operations by at least \$3 billion per year. These annual savings will result from the more efficient management of our logistical system and will not be achieved through a reduction in the strength of our combat forces.³

Secretary McNamara estimated that since 1961, the DoD had taken action that would reduce costs by \$750 million in FY 1963, and that these savings would represent 25% of the five-year goal. This cost reduction would be achieved in three ways:

1. Buying only what we need.
2. Buying at the lowest sound price.
3. Reducing operating costs.⁴

Item (2) buying at the lowest sound price, has led to a reduction of the use of Cost Plus Fixed Fee contracts and the increased use of fixed price

³U.S. Department of Defense. The Secretary of Defense, Memorandum for the President, Defense Department Cost Reduction Program. 5 July 1962.

⁴ibid.

or incentive contracts. Secretary McNamara reported in his memorandum to the President⁵ that these actions saved approximately \$100 million during FY 1963 alone.

The Incentive Contract

The use of incentive contracts provides a motivating factor to the contractor in the form of an additional monetary reward for increased efficiency and productivity which are mutually advantageous to both the contractor and the Government. This was done in an attempt to reduce the costs to the government and at the same time provide the contractor with sufficient profit motivation to increase his efficiency.

An incentive contract is based upon a negotiated target price, a negotiated target profit, and a sharing arrangement based on over-runs and under-runs. The over-run is the contractor costs over the negotiated target costs and the under-run, the contractor costs under the target cost. The contractor's profit is then based on a proportionate share of his over/under-runs from the target cost as determined by the sharing arrangement. Incentive contracts can reduce costs to the government by offering stimulus to the contractor for greater profits. For example, Table 2 is a unit cost history for the procurement of 68i C/KC-135 aircraft from the Boeing Company.

The Purpose

The reason the efficient use of military (and other Government) resources is a special problem is the absence of any built-in mechanisms, like those in the private sector of the economy, which lead to greater efficiency. . . In government by contrast there is no profit lure, and promotions or salary increases do not depend on profits. . .

⁵ibid.

TABLE 2
UNIT COST HISTORY -- C/KC-135 AIRCRAFT PROCURED FROM THE BOEING COMPANY'S TRANSPORT DIVISION
(THOUSANDS OF DOLLARS)

Contract Number	Aircraft Quantity	Contract Type	Sharing Percent	Aircraft Unit Cost Proposed	Negotiated Unit Cost	Indicated Final Unit Cost	Target Profit	Final Profit	Final Profit To Final Cost
29410	29 KC	FPI	75/25	\$ 7,046	\$ 6,627	\$ 7,090	\$ 530	\$ 414	5.8%
31525	68 KC	FPI	80/20	2,974	2,893	2,700	231	269	10.0%
33012	118 KC	FPI	75/25	1,892	1,856	1,722	107	132	7.7%
34694	130 KC	FPI	80/20	1,632	1,604	1,545	128	140	9.1%
37871	81 KC	FPI	80/20	1,659	1,587	1,446	127	155	10.7%
40063	56 KC	FPI	75/25	1,598	1,498	1,403	120	144	10.2%
40063	10 C	FPI	75/25	2,288	2,188	2,150	176	186	8.6%
41979	65 KC	FPI	75/25	1,528	1,405	1,367	120	130	9.5%
41979	5 C	FPI	75/25	1,687	1,644	1,484	140	180	12.1%
41979	15 C-135B	FPI	75/25	2,335	2,292	2,068	193	249	12.1%
43416	89 KC	FPI	70/30	1,449	1,375	1,396	117	111	7.9%
43416	15 C	FPI	70/30	2,089	2,018	1,847	172	223	12.1%

SUMMARY:

Total Target Cost	681 Aircraft	\$1,345,525,000
Total Final Cost	681 Aircraft	<u>1,289,599,000</u>
Total Target Profit	681 Aircraft	\$ 104,022,000
Total Final Profit	681 Aircraft	<u>112,786,000</u>
Total Incentive Earnings		<u>\$ 8,764,000</u>

TABLE 2 --Continued

- Note 1 - Proposed and negotiated target costs are adjusted for changes to be compatible with final cost.
- Note 2 - Final settlements have been made on the first three contracts. The indicated final unit cost on the balance of the contracts represents the Contractor's current estimate as of this procurement.
- Note 3 - All contracts have target profit computed at 8% of target cost with the exception of Contract 53012 which was successive formula with an initial target of 8% and a reset target of 5.9%, and Contract 41979 and 43416 which were computed at 9.5% profit.
- Note 4 - 10 KC-135 airplanes converted to C-135 configuration Contract AF 40063, Supplemental Agreement No. 20. 7 KC-135 airplanes converted to C-135 configuration and 13 additional C-135 airplanes added to Contract AF-41979, Supplemental Agreement No. 6.

Thus there is neither an adequate price mechanism to reveal the cheapest methods of performing public functions nor any force which induces or compels the government to adopt such methods. . . There must be some way to provide postmasters and depot managers with more appropriate motivations.⁶

The use of incentive contracts has led to reduced costs to the government. These reduced costs have been obtained as a result of providing the contractor an incentive, greater profit for improved efficiency.

The purpose of this thesis is to investigate the use of incentives within industry for personnel motivation, establish a basic philosophy and concept for incentive use, and determine whether or not the USAF organic maintenance program for aircraft maintenance operates in a parallel environment. Or stated more succinctly: Incentives are used in industry to obtain greater efficiencies of operation and the question to be resolved is, does the USAF organic maintenance program for aircraft maintenance, possess a similar environment to obtain greater efficiency through the use of incentives?

Methodology Used in the Study

Environmental comparisons are made between industry and the USAF maintenance program to determine the feasibility of an industrial-type incentive program applicable to the USAF. To accomplish these comparisons:

1. The literature is reviewed to trace contemporary history and develop a concept and philosophy necessary for the successful application of incentives.
2. The parallelism of incentive environments between industry and

⁶Charles J. Hitch, and Roland N. McKean, The Economics of Defense in the Nuclear Age, (Cambridge, Mass.: The Colonial Press for Harvard University Press, 1960), pp. 105-109.

the USAF organic maintenance program is studied and an examination is made of existing differences.

Summary

Maintenance economics necessitate the review of present management procedures and practices. The need for greater economy requires innovations and exploring for the new, the different, and the unique. One such innovation has been, and is, the increased use and reliance on incentive contracts to reduce costs to the government in procurement actions with private industry. The very foundation for achieving these reduced costs is the profit motive associated with free enterprise in our society. The heart of this profit motive is the efficiency with which the individual can produce for the company, plant, or industry. This fact has been recognized by private enterprise and as a result various methods of rewarding efficiency have been studied, developed, and placed into use as a means of motivating or stimulating the individual to obtain greater efficiency in production output.

The purpose of this thesis is to investigate the use of incentives within industry for personnel motivation, establish a basic philosophy and concept, and determine whether or not the USAF organic maintenance program for aircraft maintenance, operates in a parallel environment.

CHAPTER II

CONCEPTS AND PHILOSOPHY FOR AN INCENTIVE PROGRAM

The purpose of this chapter is to explore the industrial use of incentives and to trace their contemporary history, develop a philosophy and concept necessary to implement an incentive program, and provide the background for incentive application within the USAF maintenance program.

The history of worker motivation in industry is directly parallel to the history of management. However, the philosophy that management uses and the techniques formulated for industrial operation are dependent on the questions: What provides the worker with the greatest job satisfaction and at the same time motivates him to work with greater efficiency to obtain the company's objectives?¹

Mutuality of interests between the worker and the employer was the theme expressed by Andrew Ure and Charles Babbage in the middle 19th Century.² At this time, the unions were almost nonexistent and those that did exist were loosely organized and semi-secret. As a result there was no common basis for the union to act as a collective agent for the employees. In the production effort, wages were usually based on piece-rate production. The more the worker produced, the more he earned, or so the philosophy

¹William G. Scott, Human Relations in Management, (Homewood, Illinois: Richard D. Irwin, Inc., 1962), p. 22.

²William G. Scott, Human Relations in Management, p. 23, citing Andrew Ure and Charles Babbage.

went. But this was not always the case. England, during the middle 19th Century, was not noted for its outstanding treatment of the worker. In fact, L. P. Alford and H. Russell Beatty referred to the situation as the "degradation of labor" and "English factory slavery."³ The greatest fallacy of the theory of piece-rate production during this period of time was that no minimum base for worker pay had been set.

The concept of mutuality of interest, expressed above, was based on the premise that it was in the best interest of the employee to work harder, to produce more, the end result being that the worker would benefit by receiving more pay and the employer would receive more profit by the increased production. This was not always the case during this period, and it usually resulted in a one-sided arrangement, that is, the employer would receive greater profit by the increase in production, but the employee would generally find a piece-rate pay decrease as a result of his increased effort.

The early writers in the field of scientific management equated all relations between management and labor to a profit motive, that is, the motivation of the worker in his production effort was directly related to money.⁴ Money was the answer to the problem of stimulating the worker regardless of the conditions of the work. Ure and Babbage established a basic premise for worker motivation: work and the worker were indisputable economic commodities, and as such they would respond to economic law, the economic man. Motivation and money were synonymous.

³L. P. Alford and H. Russell Beatty, Principles of Industrial Management, (Revised edition, 1951: New York: The Ronald Press Co., 1940), p. 13.

⁴Scott, p. 24.

Working conditions in the mid-19th Century England were intolerable for the worker. So much so, that it necessitated the beginning of the English Factory Acts. The first Act and succeeding amendments limited working hours by sex and age because conditions were becoming so bad, they were intolerable even to the English government.

One would ask, "What is the relation between the English Factory Act and motivating the worker?" The answer is relatively simple--it was the beginning of the scientific management movement. This movement was defined by Alford and Beatty as the acceptance and use of accumulated experience, convictions, and knowledge of fundamentals that became part of the intellectual system. It replaced the trial and error method by using established results contained in laws and principles.

Mutuality of interest between employer and employee now became important because this concept emphasized that one cannot do without the other. Applying the scientific approach to management this mutuality became even more important due to the interwoven relationship between profit, efficiency, and productivity in a free enterprise society. The management theorists of that time held that man would extend himself to greater efforts if he knew that his labor would result in greater rewards for himself.

The scientific management movement opened the field for the innovator in industrial management. Ralph C. Davis was one of these innovators. In his book "Industrial Organization and Management," he developed business objectives, ethics, policies, and the role of leadership in business.⁵ He progressed further until he made an analysis of the basic management functions of planning, organizing, and controlling.

⁵Ralph C. Davis, Industrial Organization and Management, (New York: Harper & Brothers, 1939)

Although not the first to define the need for management, this was probably one of the first works to be completely professionally oriented.⁶

The Chicago Hawthorne Works of the Western Electric Co. conducted experiments to determine the physiological reaction of the worker to changes in environment. The original study was developed to determine the effects of stages of plant lighting. The original assumption was that as the amount of light within the production area was decreased, the amount of output by the workers would also decrease. The results did not bear out this assumption; in fact, the exact opposite occurred, as light decreased, production increased.⁷

These results led to later studies in the psychological aspect of industrial organization and worker motivation. The conclusions of the Hawthorne study emphasized the psychological as well as the physiological needs of the worker.

The parallelisms that were beginning to form between the human relationists and the studies being made in industrial production soon disproved the theories of the early management philosophers. The economic man was no more. This philosophy was replaced by a modern philosophy that the manager must not only meet the needs of the organization but also meet the needs of the worker. Davis recognized this in his later work, "The Fundamentals of Top Management," in which he described the informal organization, social status and the psychological needs of the worker.⁸

⁶Scott, p. 34.

⁷Edwin Scott Roscoe, Organization for Production, (Homewood, Illinois: Richard D. Irwin, Inc., 1959), p. 38.

⁸Ralph C. Davis, The Fundamentals of Top Management, (New York: Harper & Brothers, 1951).

The manager today must meet not only the requirements of the organizations' objectives, but also the workers' needs to meet these objectives.

Since the end of World War II, an increasing number of companies have become more concerned about their incentive compensation practices. This concern has led to many studies made by the companies themselves to determine the practices carried out by industry for both managerial and supervisory compensation. The National Industrial Conference Board, Inc.,⁹ has made several studies in this area. In their Personnel Policy Study No. 177, the Board surveyed 363 firms, 262 (72.2%) of which were non-manufacturing companies employing 767,086 personnel. This survey encompassed all aspects of supervisory compensation from determination of base pay to participation in incentive arrangements.¹⁰ Although primary interest in this thesis is incentive compensation, it is worthy of note to mention a few of the findings made as a result of the study.

Approximately 85% of the companies included in the survey reported that salaries of the first-line supervisor were based on the going rate in the industry or area or both.

The majority of the companies surveyed varied the pay of supervisors according to individual performance, job duties, and seniority. Eighty-six percent of the companies made individual adjustments on merit only; approximately one-half of the companies made adjustments at regular intervals, usually on a calendar basis or on the employment anniversary

⁹The National Industrial Conference Board is a nonprofit, fact-finding laboratory. It was organized in 1916. Since then, it has served as an institution for scientific research in the fields of business economics and business management.

¹⁰National Industrial Conference Board, Inc., Compensating First-line Supervisors in Factory and Office. Studies in Personnel Policy No. 177. New York: National Industrial Conference Board Inc., 1950.

date. Many companies made salary adjustments when warranted by the merit of the employee. Forty-three companies restricted the size of the increase to 5% to 10% of the individual's base pay. More than half of the 363 companies participating in the study paid supervisors some form of incentive compensation.

Incentive Concepts and Philosophy

Writers in the field of personnel/industrial relations agree almost unanimously that an incentive is a stimulus that provides motivation to the recipient. All agree that incentives may take the form of financial and non-financial, positive, and negative, and individual and group recognition. All agree that a successful incentive program must be simple to administer, simple for the workers to understand, and accepted by both manager and worker alike. Incentive plans employed by industry are numerous, ranging from simple piecework to highly complex plans with arrangements for bonus and premium payments.¹¹ Incentive plan objectives are simple; they attempt to tie together high productivity, high wages, and low production costs. However, all incentive uses in the production effort are based on standards established for a specific job.

Frederick W. Taylor, considered one of the outstanding leaders in the field of industrial management, was one of the first to employ the use of job standards in conjunction with careful analysis of the best methods of accomplishing a given task. Once the standards are established, the best method determined, the company was then in the position to award the worker an additional bonus for meeting or exceeding the given standards.¹²

¹¹Charles W. Brennan, Wage Administration, (Homewood, Illinois: Richard D. Irwin, Inc., 1963), p. 224.

¹²Frederick W. Taylor, The Principles of Scientific Management, (New York: Harper & Brothers, 1942), p. 9.

The point is, before any incentive plan can be effectively introduced, two elements must be established: standards must be set for job performance, and base pay must be equal to the "going rate" within the industry or the locale in which the company is located, or both. The necessity for establishing accurate standards is pointed out by Scott,¹³ Alford and Beatty,¹⁴ Belcher,¹⁵ and others. If these standards are too "loose," the average worker can easily exceed the standards, thereby resulting in increased production costs and lowered efficiency. If the standards are too high, the result can lead to morale deterioration among the employees due to the difficulty in exceeding or in some cases even reaching them.

Once standards have been set, the employer can develop a sound incentive program. Again, criteria must be followed to determine what constitutes a sound program. Brennan establishes six essentials,¹⁶ Alford and Beatty four.¹⁷ The similarities between the two sets of essentials suggest consolidation.

1. The plan must be simple, it must be free of complex and intricate arrangements; the employee must be able to calculate his earnings for himself with little difficulty. Complex plans do not lend credence, the employee does not trust them.

2. The plan must be equitable, in no case should an employee receive less wages under an incentive plan than he would have received under a guaranteed wage.

¹³Scott, p. 254.

¹⁴Alford and Beatty, p. 671.

¹⁵David W. Belcher, Wage and Salary Administration, (New York: Prentice-Hall, 1955), p. 374.

¹⁶Brennan, p. 226.

¹⁷Alford and Beatty, p. 675.

3. The plan must provide an incentive; goals and standards set to qualify for an incentive plan must be carefully set; neither too high nor too low.

4. The plan must be based on sound standards; this constitutes a two-part plan: guaranteed wage or fixed payment for a given amount of production and additional payment for production which exceeds standards.

5. The plan must have the backing of the employees. This implies the active participation of the employees.

6. The plan must have the backing of management to encourage employee backing.

The primary difference between Brennan's and Alford and Beatty's essentials lies in the latter's additional proposal that incentives must reward generously. The reward should be in direct proportion to the contribution the employee makes to the company.

Incentive Compensation for Supervisors

Many companies believe that the attitude and production of the worker are dependent upon the supervision the employee receives. As a result, these companies have included the supervisor in some form of incentive plan. The objectives of a supervisory incentive plan is to encourage cost-consciousness and at the same time reward the supervisor for his constructive and beneficial efforts to reduce the costs of his operations.¹⁸

Again, there is no one plan, no one system, no one standard, on which to base supervisory incentive compensation. It was found, however, in Personnel Study No. 177, that companies which limit total compensation of supervisors to base pay make extensive use of non-financial incentives.¹⁹

¹⁸Brennan, p. 313.

¹⁹Studies in Personnel Policy No. 177, p. 56.

There is a general belief among industrial psychologists that non-financial incentives are the strongest among supervisory personnel if base salaries are equitable and there is some degree of job security.

There are both scoffers and advocates of each form of supervisory incentive compensation. For example, many companies believe that year-end or Christmas bonuses serve very little purpose as a motivational stimulator, acting only as an appeaser because there is either no, or very little relation between the worker's production and the year-end bonus. The bonus as an incentive, must be directly proportional to the individual efforts of the employee concerned and not as an automatic boon, to be dispensed as a token of a company's good will.

Profit-sharing plans: Profit-sharing plans can take one or two forms--current or deferred. Under the current plan, profits are dispensed as a year-end bonus. The deferred payment plan generally provides for payment after retirement, disability, or death.

Production-sharing plans: Production-sharing plans are hybrid forms of the profit-sharing plan.²⁰ This type plan is more commonly known as the Scanlon Plan, named for its originator, Joseph L. Scanlon. This plan attempts to mobilize the entire organization into a cooperative force. The aim is to reduce costs, the reward: a share in the reduced costs as a bonus. The Scanlon Plan is based on job standards. In addition to reducing operations to a common denominator that the workers can understand, such as units stored and/or produced, the plan also uses a suggestion system for job, department or plant, to reduce costs in the manufacturing process. A committee is formed from each department to review and pass on the applicability of the employee's suggestions. If the suggestion leads to reduced

²⁰Ibid, p. 59.

costs for the applicable department, a group share of the savings would go to the employees as a bonus. The percentage saved is prorated to each employee and the amount received is figured on this percentage times the worker's base pay.

The Scanlon Plan, like others, is dependent upon standards being established for the production unit and the necessary controls to insure feedback of information, in this instance, for cost control purposes.

There are, however, certain basic steps that should be followed in establishing a supervisory incentive plan.²¹ First, the factors to be used for measurement must be determined. The proper selection of these factors should insure that the supervisor directs his attention to the important aspects of the job, and the supervisor should have control over the factors used. If material costs are a factor, the measurement should be in re-work and waste, not on the market price of the material used. Each factor selected should be weighed with respect to the proportion that individual costs add to the total costs of the individual department or total company volume.²² After weighing the factors selected, standards must be set on each factor value. This can be accomplished by establishing a norm of production over a period of time, by the use of standard leaders in the department in question, or through the use of learning curves. Standards, however, must be set on an equitable basis. Some writers say that standards should be between 70% to 80% of what is expected to be optimum production.

The basis for rewards and penalties can be set once the standards

²¹Belcher, p. 399.

²²The weighting of factors is a matter of choice, however, the weights assigned should be related to the costs of the selected factor. If direct labor hours are the high-cost factor, more weight should be placed on motivating labor than, say, on scrap salvage. For a more detailed explanation on incentive weights, the reader is referred to Belcher's Wage and Salary Administration, p. 400.

have been developed.²³ For example, positive bonus points can be scaled from 0 on standard production to 20% to 25% for reaching what is described as optimum production. Negative points can be assessed for production below the standard volume.

The last step is the notification to each supervisor of what is expected, the standards which have been set, how bonus points can be accumulated and assessing penalty points. The supervisor must then be notified periodically of the standing of his department in the incentive program.

The Personnel Study No. 177²⁴ sums up the reasons for success of incentive plans in companies participating in their study as follows:

1. Company sincerity. - Workers recognize the incentive plan as being a sincere effort on the part of the company to share prosperity.
2. Planning stability. - The companies using incentive plans generally operate the same formula for a period of time, usually one year. The companies are honor-bound not to change just because good supervision pays off to the supervisor more than the company expected.
3. Realistic standards. - Performance is measured in terms of reliable standards and is rewarded when these standards are exceeded.
4. Simplicity and clarity. - The formulas used for computing pay can be readily understood by the participating personnel.
5. Team participation. - Supervisors feel related to the management of the company. This by itself provides a strong morale factor to the supervisors and makes them feel "part of the management team."

²³It is apparent that on a group effort, such as the Scanlon Plan, this application of incentives would certainly create the need for harmony and cooperation among the employees.

²⁴Studies in Personnel Policy No. 177, p. 66.

Executive Incentive Compensation Plans

Executive incentive compensation which varies from industry to industry presents a slightly different insight into the problem of providing supplemental income to the executive than the supervisory personnel. The objectives for both groups are the same. Belcher generalizes these objectives as:

1. To obtain and maintain an adequate source of capable personnel.
2. To provide rewards proportional to the level of the work within the organizational structure.
3. To provide incentives to obtain production within the level of capability of the individual.²⁵

The concept of applying a motivational force to obtain greater efficiency does not change between the supervisor and the executive. What does change is the type of stimulation applied. But, and this is most interesting, each company, prior to establishing an executive plan, must determine (1) that salaries are adequate (comparable to locale or industry) and, (2) salaries must be proportional to the level of the executive when considering functions and responsibilities. Once these two facets of compensation are established by the company, they can then proceed to develop an executive incentive plan.²⁶

Belcher, divides executive incentive plans into two categories: incentive plans and tax savings plans.²⁷ The incentive plan is further divided into cost reduction or profit type and standard accomplishment.

²⁵Belcher, p. 404.

²⁶Ibid.

²⁷Ibid, p. 405.

In the former, executives are judged by their cost reduction accomplishments which lead to greater company profits and are rewarded accordingly. In the latter, the executive is judged by his standard accomplishment. Again, to make effective use of the standard accomplishment, it is necessary to set standards in each of the principal divisions within the company. The identity of the executive standard plan is so similar to the supervisory plan that further discussion would serve no practical purpose.

The cost reduction or profit plan. - The cost reduction or profit plan is based on two factors, (1) the executive's job profit potential which can be measured in terms of units produced at a lower price, product quality, meeting schedules, and facility utilization, and (2) at the end of the company's fiscal year, the measurement of the potential realized. Based on established formulas, the bonus compensation concluded that a successful plan required a minimum bonus of 30% of base pay.²⁸

Tax savings plan. - It is not enough to provide additional increments of "base-pay" with the current progressive income tax. The tax structure is so designed that as the income increases, the proportional return is decreased as far as the executive is concerned. This defeats the purpose of executive incentive compensation as far as the company is concerned, and in some cases may even be a hinderance to the executive progression pattern within the company itself. This can come about through top executives refusing the added bonus to the "pay-check" due to the tax structure. This in turn can reflect upon the scale of the executives down the line in the organizational hierarchy.

There is almost no limit to the combination of tax savings plans which industry offers its executives. In Personnel Studies No. 173 and 179,

²⁸Arch Patton, "Who Should Get Stock Options," Personnel Journal, Vol. 30, No. 1, (April 1952), pp. 417-424.

the Board listed some of these plans which are being used in various industries:²⁹

Installment Bonus Plan. - The executive "earns out" the bonus in a period of time, usually four to five years. If he resigns during this period of time, he forfeits the remaining installments.

Deferred Bonus Plan. - The bonus award is paid at the time the executive terminates his employment with the company.

Stock Purchase Plans. - This allows the executive to buy stock in the company at less than market price.³⁰

Each of the above plans are deferred compensation plans designed to provide the executive a "break" on the tax structure and at the same time permit him to "reap" the benefits of his productive effort toward achieving the company goals.

Other benefits for the executive can include such features as:³¹

Finance employees at low rates of interest. - This can be for home buying, home improvements, and other needs which the employee may have. This financial assistance can take place at a much lower interest rate than could be obtained commercially.

Supply other needs at discount costs. - This can include such items as company operated home maintenance crews, sale at discount costs such items as furniture, subsistence items, hospitalization for the entire family, company furnished legal counsel, use of company-owned recreational facilities, educational costs, group health and life insurance programs, and

²⁹Studies in Personnel Policies No. 173, dated 1959, and Study No. 179, dated 1960.

³⁰This is closely controlled by the 1950 Revenue Act, and sets prices that stock can be sold and options concerning the capital gain rates.

³¹William J. Casey and J. K. Lasser, Executive Pay Plans (1962-1963), (Roslyn, New York: Business Reports Inc.), pp. 14-15.

numerous other "fringe" benefits at either company expense or at a reduced cost to the employee.

The limit of executive incentive compensation can be reached only through the limit of one's imagination; but, there is one thing common to each of the financial plans and that is, there must be some form of measurement to determine the executives efficiency within his area of responsibility. This measurement, or the setting of standards to make this measurement, is probably one of the most crucial acts in which a company will engage.

Summary

Worker motivation has been a problem that has plagued the manager since the first employer/employee relationship was established. This problem was expressed by early writers as a "mutuality of interest" between the worker and his employer. The more the worker produced, the more he earned, but this was not always the situation. In the middle 19th Century England, the employer was not interested in the workers' lot, a fact that necessitated the English Factory Act and succeeding changes to that Act. This was one of the first national regulations that recognized the conditions under which the worker was employed.

The English Factory Act, and its resulting changes, brought about the first studies in scientific management. These studies resulted in the recognition that conditions, other than purely economic, had to be changed in order to provide worker motivation.

The scientific management movement opened the field for the innovator in industrial management. The recognition that the plant or company was also a community, subject to all the ills of a community, led to additional industrial research on worker motivation, production possibilities through motivational effort, and reduced operating costs.

Various plans were introduced to obtain or provide for worker motivation. Some plans were more successful than others, some were developed for the worker, others for the supervisors, and still others for the manager or executive. But each plan had commonality of purpose and the hoped for effect, reduced operating costs, increased profits, and the recognition that extra effort and success in meeting goals or standards must result in some form of reward to the individual or group contributing to objective attainment.

It has been generally concluded by most motivational researchers in industrial relations, that two elements must be in being before a sound incentive program can be established; (1) standards must be set for job performance, and (2) the pay rate must be equal to the "going" rate within the industry or locale. The setting of standards is probably the most critical from the motivational aspect.

The application of incentives for both supervisory and executive personnel varies from company to company. There is no one magic formula to determine the best, the one leading to greater production, or the one giving the most employee satisfaction. This is dependent upon the company objectives, size of the company, the industry itself, production volume, sales volume, and many other factors that must be weighed individually.

Regardless of the plan used, the end result should be the same. The company's objectives should be attained and the results produced should be met by the company with a reward proportional to the contribution the employee makes to the company's success.

CHAPTER III

USAF INCENTIVE APPLICATION

The purpose of this chapter is to explore the possibilities for incentive uses within the USAF maintenance program. In addition, a comparison will be made to determine if the USAF maintenance environment is compatible to the use of an incentive program such as found in industry. The concept of work standards being used as an efficiency measurement, developed in Chapter II, will be applied and an examination will be made subsequently of four Air Force sponsored incentive programs. Two of these programs are applicable throughout the Air Force, one is applicable to all logistic organizations, and one is applicable only to the maintenance effort.

Any manager is concerned with the use of resources such as time, material, personnel, and money. The determination of what resources will be used, how they will be used, and when they will be used are all part of the manager's responsibility. If he is cost conscious he will use these resources sparingly, with only minimum quantities of each being consumed to accomplish his objectives. If he does not give consideration to the element of expense, he can indeed be wasteful of resources. This by no means implies negligence, rather it implies that it becomes necessary to draw his attention to the efficiency which his position dictates.¹ In

¹The over-all objective of Air Force management is to achieve maximum operational effectiveness in accomplishing the essential missions assigned. . . The proof of success of management is operational effectiveness. . . commanders

this respect, the problems faced by the military manager are no different than the problems faced by his civilian counterparts in industry. When defense per se, is eliminated from the responsibilities of the military manager, he becomes responsible for an industrial, commercial, wholesale, or retail operation. If he were selling his commodities on a competitive basis, his problems would be the same as any other manufacturer, wholesaler, or retailer. To compete, he would have to be aware of the need for efficiency of operation.

The military manager cannot be relieved of the responsibility for defense. He cannot be placed in a position of having to compete with other commercial enterprises. He cannot be expected to produce a profit which in this sense is a monetary return over and above his actual costs. There are times when he is confronted with situations not conducive to efficiency, such as unscheduled maintenance requiring overtime, unprogrammed requirements or unexpected emergencies using resources for which there is no reimbursement, either budgeted or funded. But, these are not the conditions over which he always has control. In most instances these are situations which are generated outside his sphere of authority and he should not be held responsible for their occurrence, only for their correction.² But, he can be expected to meet his quantitative requirements. He can be expected to operate efficiently within his control of resources, and where possible, reduce

must be alert to conserve resources--to produce a maximum volume of end-products without waste of resources and time. To this end, each commander must use efficient ways for doing things. The delivery of end-results of work must be evaluated in terms of their correspondence with the requirements, in volume, quality, and time, as established in the assigned mission. This evaluation is the basis for judgment as to whether the commander--as a manager--performed what had been expected. (U.S., Department of the Air Force, The Management Process, AFM 25-1. Washington: September 1954, pp. 2-3).

²This upholds one of the basic concepts in the establishment of an incentive program. The person responsible, either supervisor or manager, must have control over the factors by which he will be judged.

his costs. These costs again, can be expressed in time, material, personnel, and money.

The variables which are encountered on a day-to-day basis in the maintenance effort are such that individual efficiency cannot be measured with the desired degree of accuracy necessary to formulate an incentive plan comparable with industry. Variables are both qualitative and quantitative. They include such factors as geographical location of equipment prior to maintenance. Equipment used in a high humidity or island environment would present greater problems in corrosion control than would like equipment used in a low humidity desert environment. The extent of preventive maintenance which the equipment receives generates another variable. So do outstanding Technical Order Compliances (TOC) which must be accomplished and the demands of quality control. Each of these examples affects work measurement standards variably.

It is a generally recognized fact that individual incentives are received with greater enthusiasm by the worker than group incentives. To provide an individual incentive program, however, it is necessary to establish individual work standards. Once standards have been established it then becomes possible to measure, with a high degree of accuracy, individual performance against these standards and weight the performance accordingly for incentive participation. The worker in the military is generally subjected to measurement in terms of comparisons, comparisons with other workers and not standards. Such comparisons do not provide sufficient objectivity. What is desired is a guide by which to measure the worker's effectiveness in accomplishing his mission in light of the resources he uses to accomplish the job. Comparison of one individual to another for the purpose of awarding some form of recognition is highly suspect at best and is not always

enthusiastically accepted by the worker. But, the fallacy of this type comparison is the inability to measure individual productive effort. The variables that are involved negate accuracy.

An incentive program is necessary but it is considered not only impractical but also impossible to provide a program that is tailored after industry for either the manager or the worker. The types of incentives which industry offers the manager or top executives include stock options, bonuses, insurance programs, and other fringe benefits. These incentives become available only as the organization succeeds in producing a profit. The final measurement of the military, however, is dependent upon its success to (1) act as a deterrent to prevent a war, or escalation of war, or (2) to emerge the winner once a war has begun. It is in this environment that the military manager must operate. It is necessary that he be concerned with efficiency, but this efficiency must be evaluated in terms of requirements established for the assigned mission.

Development of an Incentive Program

In Chapter II, incentives were classified by financial, non-financial, group, individual, positive and negative. It was also stated that one primary requirement which must be met in the establishment of a successful incentive program was the setting of standards against which production could be closely measured. This is necessary to determine individual or group performance.

In a manufacturing process, individual standards can be set. The function to be performed, however, must be measurable in terms of individual units produced, assembled, or some other means which recognizes a cost factor based on unit production for a job that has little variation. Costs are then directly related to individual or specific performance. Standards can

then be established for individual worker evaluation either on time or cost variances for a unit of production.

Job-lot programming is not considered conducive to the establishment of individual performance standards. It is in this environment that the USAF maintenance effort is conducted. The use of job-lot programming only attempts to determine an estimate of what the total job would cost, either in dollars or manhours.³ This does not eliminate the use of group incentives and this approach will be examined later.

In a manufacturing process, industry generally accepts a standard work measurement that has an accuracy factor of from 3% to 5% variation from the standard mean.⁴ This is based on individual performance. Headquarters Air Force Logistics Command (AFLC) has developed four major direct labor standards. These are described in the AFLC manual 66-4 as follows:

Type 1A and 1B ENGINEERED STANDARDS

Type 1A. Labor standards established by the industrial engineering division, using a recognized technique such as time study, methods-time-measurement, work sampling, or standard data, and labor standards applied by production control personnel using standard data established by the industrial engineering division. Standards in the Type 1A category should be backed up by sufficient data to statistically support an accuracy of plus or minus 10 percent of the mean, with a 95% confidence level. Refer elsewhere in this section for the methods used to statistically support an accuracy of plus or minus 10 percent of the mean, with 95% confidence level.

Type 1B. Labor standards established by the industrial engineering division using recognized techniques such as time study, work sampling, or

³Accountants or persons with accounting experience may take exception to this terminology. It is being used here to refer to a method of work programming to accommodate a large number of units being processed on a lot basis and for which an estimate must be made on the work to be accomplished. This allows for variations between individual units and which is normal in a maintenance process. (Robert N. Anthony, Management Accounting, Homewood, Illinois: 1960, pp. 364-365).

⁴Interview with Mr. Harry Stiles, Industrial Engineer, Headquarters Air Force Logistics Command, Wright-Patterson AFB, Ohio, May 1964.

standard data, and labor standards applied by production control personnel using standard data established by the industrial engineering division. Standards in the Type 1B category should be backed up by sufficient data to statistically support an accuracy of plus or minus 25% of the mean, with a 95% confidence level.

Type 2. ENGINEERED ESTIMATES

Type 2. Labor standards established by industrial engineering using recognized techniques such as time study and standard data established by industrial engineering. Standards in the Type 2 category should be backed up by engineered estimates, (refer to chapter 2, section 4, para. 3g. of this manual for procedure for establishing an engineered labor standard), one cycle time studies or time studies which do not satisfy the criteria for Type 1 classification.

Type 3. ESTIMATES

Type 3. Labor standards established by industrial engineering with coordination and agreement as necessary by production control, quality control, etc., personnel. This type labor standard is to have very limited use in cases where it is not economical or feasible to establish Type 1 or 2 standards such as one time jobs.

Type 4. MODIFIED ACTUAL HOUR STANDARDS

Type 4. Any item of production for which the industrial engineering division has not or cannot establish a standard of another type, the actual hours required to perform the work modified by the work center's prior period direct labor effectiveness, will be considered a standard when approved by the industrial engineering division. This type standard is to have very limited use on a one time basis only. No more than 5% of the direct on-base work in any work center should be covered by this type standard in any reporting period. It is recommended that insofar as possible, this type standard not be used.⁵

The AFLC labor standards set forth above allow for an accuracy variation of plus or minus 10% of the mean in a Type 1A standard and a plus or minus 25% of the mean in a Type 1B standard. This allowable accuracy is not compatible with standards established for a manufacturing process in industry and creates the problem of determining the validity of individual performance as a basis for an award. The variation from the standard must be held to a

⁵U.S., Air Force Logistics Command, Industrial Engineering Manual. AFLCM 66-4 (Wright-Patterson AFB, Ohio: 30 September 1960), Chapter 2.

minimum if accurate performance measurement is to be made between individuals and/or groups.

The inability to establish individual work standards for performance evaluation in the Air Force depot maintenance program and the reliance on job-lot processing tend to negate the use of individual standards for work measurement. It does not, however, negate the use of incentives as a means of recognizing individual performance within a group.

Performance can be measured by the job-lot method. This measurement may not be as accurate as one would expect with the allowable accuracy variations built into the engineered standard system, but it does provide a basis for measurement of direct-labor usage.

Air Force Logistics Command Regulation 66-31 establishes additional requirements for the feedback of data to provide comparisons of actual costs to standard costs in these areas:⁶

1. Direct labor performance.
2. Labor rate.
3. Direct material usage.
4. Overhead expenditure.
5. Volume (production and overhead) variances.

The inability to set individual performance standards within the depot complex is further magnified at the base level. This is due to variance of resources, base activity, mission requirements, aircraft types, skill levels authorized versus assigned, and other non-measurable factors.

In establishing an incentive program, one must recognize that a different system of motivational stimulus is applicable at each stratum within the

⁶U.S., Air Force Logistics Command, Maintenance Engineering, AFLC Regulation 66-31 (Wright-Patterson AFB, Ohio: 2 February 1961).

organization and that an incentive value should be in proportion to the effort that led to the contribution.⁷ What is effective for the worker might be ineffective for the supervisor or manager. The worker may respond to a monetary incentive whereas the supervisor or manager quite possibly would respond more favorably to a promotion, formal training for a higher position, or the opportunity to progress from a wage employee to a salaried employee. A \$25 bonus would be more meaningful to an airman of the lower four grades (Airman Basic through Airman First Class) than it would be to an officer of field-grade rank (Major through Colonel).

In addition to the inability to set closely measurable work standards, personnel, both military and civilians, in the USAF maintenance program are limited by present legislation to the types of awards which may be used. These limitations take the form of promotion quotas, pay and allowance ceilings, and other restrictions affecting compensation practices within the military structure. This does not mean that incentive programs cannot be developed, but, at this time, it does limit their use. Industry, on the other hand, does not face these same restrictions, or if they do, they are self-imposed.

Incentives which require the measurement of individual performance, are not considered compatible for USAF maintenance application. However, individuals can be recognized for outstanding contributions to the group effort. Although this measurement is subjective, it is better than no recognition at all. Incentives, therefore, can be used for (1) group performance, and (2) individual recognition within the group. The following programs provide for this recognition.

⁷Supra, p. 20.

USAF Sponsored Programs

The Air Force Suggestion Program: One of the more publicized programs within the USAF to recognize Federal employees for suggestions which they make leading to tangible or intangible savings to the government is the Air Force suggestion program. This program is authorized by Air Force Regulations; AFR 35-12, Military Suggestion Program; AFR 40-470, Civilian Personnel Incentive Awards; and AFR 40-472, Civilian Personnel Cash Awards for Suggestions and Inventions. The basic Air Force purpose for each regulation is identical: to encourage participation by employees in improving Air Force operations, and recognizing and rewarding those personnel who contribute outstandingly to efficiency or economy to improve government operations.

Tables 3 and 4 reflect the monetary awards which can be given to civilian employees of the Federal Government:⁸

TABLE 3
COMPUTATION OF AWARDS--AWARD SCALE FOR TANGIBLE BENEFITS

BENEFITS	AMOUNT OF AWARD
\$ 50-\$ 300-----	\$15.
\$ 301-\$ 10,000-----	\$15 for the first \$300 in benefits and \$5 for each additional \$100 or fraction thereof.
\$ 10,001-\$ 20,000-----	\$500 for the first \$10,000 in benefits and \$5 for each additional \$200 or fraction thereof.
\$ 20,001-\$100,000-----	\$750 for the first \$20,000 in benefits and \$5 for each additional \$1,000 or fraction thereof.
\$100,001 or more-----	\$1,150 for the first \$100,000 in benefits and \$5 for each additional \$5,000 or fraction thereof.

U.S., Department of the Air Force, Incentive Awards, AFR 40-470.
(Washington: 5 October 1962).

TABLE 4

INTANGIBLE SCALE FOR SUGGESTIONS, SPECIAL ACTS, OR SERVICES

EXTENT OF VALUE	EXTENT OF APPLICATION		
	LIMITED	BROAD	GENERAL
MINOR	\$ 15-\$ 25	\$ 15-\$ 25	\$105-\$200
MAJOR	\$100-\$200	\$200-\$300	\$350-\$500
EXTRAORDINARY	\$300-\$450	\$450-\$750	\$750 UP
EXTENT OF VALUE			
MINOR-----	Idea, while not new or original, is a better adaptation or more efficient operation. Improvements in health, welfare, morale, or daily operations which have restricted usefulness. Safety improvements which reduce hazards that could result in minor injury or possible loss of time from work.		
MAJOR-----	Idea, while not new, is an unusual application of an old idea. Improvements in health, welfare, morale, or daily operations which have a high degree of usefulness. Safety improvements which eliminate hazards that could result in injury or loss of time from work.		
EXTRAORDINARY-----	Idea is a new application of an old idea, or a new principle or invention. Improvements in health, welfare, morale, or daily operations which are of very outstanding usefulness or value. Safety improvements which eliminate hazards that could result in loss of life or faculty.		
EXTENT OF APPLICATION			
LIMITED-----	Applicable to (a) small numbers of employees or small area of operation at employee's installation, or (b) small numbers of employees or small area of operation at other installations within a major air command, several major air commands, or the Air Force.		
BROAD-----	Applicable to (a) large numbers of employees or large area of operation at employee's installation, or (b) substantial numbers of employees or significant area of operation at other installations within a major air command, several major air commands, or the Air Force, or (c) command-wide in scope or interest.		

TABLE 4 --Continued

GENERAL-----Applicable to large numbers of employees or large area of operation within several major air commands, or Air Force wide in scope or interest.

Air Force Regulation 35-12, which governs the Military Suggestion Program, recognizes that legislation does not permit payment of cash awards to military personnel; however, the use of nonappropriated funds is authorized for this purpose. The limitations are contained in Table 5.⁹

TABLE 5

MILITARY SUGGESTION PROGRAM AWARDS

<u>APPROVED AT</u>	<u>AMOUNT OF AWARD</u>
Base level-----	\$ 25
Subordinate command level-----	\$ 50
Major command level-----	\$100

The regulation further recognizes meritorious suggestions with military incentives in addition to the monetary award such as:

Military decoration--Legion of Merit or the Air Force Commendation Medal.

Favorable communication--Letters or certificates of commendation or appreciation.

Three-day passes, or other non-monetary recognitions.

The Air Force also sponsors an annual military suggestion contest for military personnel, with monetary awards made available through the use of non-appropriated funds. These awards are indicated in Table 6.¹⁰

⁹U.S., Department of the Air Force, Military Suggestion Program, AFR 35-12. (Washington: 22 July 1960).

¹⁰Ibid.

TABLE 6

ANNUAL AIR FORCE-WIDE MILITARY SUGGESTION CONTEST

The Air Force will sponsor an annual military suggestion contest, with monetary awards made through a special allocation from the Air Force Central Welfare Fund. Any suggestions made by USAF military personnel (and forwarded by major air commands and the evaluating agencies as described in AFR 35-12) during each fiscal year will also, if it is considered to have a first-year tangible saving of \$50,000 or more, or an intangible benefit of extraordinary value* and general application**, be considered in competition at Headquarters USAF. The awards for the USAF-wide contest are:

First Place-----	\$1,500
Second Place-----	\$1,000
Third Place-----	\$ 750
Fourth Place (2) @ \$500-----	\$1,000
Fifth Place (2) @ \$300-----	\$ 600
Sixth Place (2) @ \$200-----	\$ 400

*Extraordinary Value--That is, a new and unusual application of an old idea, or a new principle or invention; an improvement in health, welfare, morale, or daily operations, which is of outstanding usefulness or value; or a safety improvement which eliminates a hazard to life or faculty.

**General Application--That is, if it is applicable to large numbers of personnel or large areas of operation within several major air commands, or is Air Force-wide in scope or interest.

Additional Awards for Performance: Additional awards, both financial and non-financial, are available to civilian personnel through Air Force Regulations 40-470, previously discussed and through AFR 40-472, Cash Awards for Sustained Superior Performance and Special Acts or Services. The latter provides for awards specified in Air Force Regulation 40-470. These awards are prescribed in Table 7.¹¹

Deputy for Systems and Logistics Award: The Deputy for Systems and Logistics Award, created by Air Force Regulation 400-22, has been established to recognize the organization and personnel contributing to the logistics mission of the Air Force. The award also provides for the recognition of

¹¹Supra, p. 33.

TABLE 7
INTANGIBLE SCALE FOR SUSTAINED SUPERIOR PERFORMANCE

Amount Of Award	General Schedule (Classification Act) GS	Wage Board W	Working Leader L	Foreman F	Oversea Teachers
\$100	1 - 4	1 - 8	1 - 7	1	-
\$150	5 - 8	9 - 13	8 - 12	2 - 8	CLASS I,II
\$200	9 - 11	14 UP	13 UP	9 - 12	CLASS III-V
\$250	12, 13	-	-	13 - 16	CLASS VI
\$300	14, 18	-	-	17	-

Note:

When no pay grade exists, awards will be computed under the following formula: Hourly rate x 2080 = total computed salary to be compared with listed GS pay schedule. The resultant comparative GS grade (1st step) will be the basis for the award determination.

three individuals within the activity that may be cited for their outstanding participation in the organization. The award provides for a scroll to be presented annually by the Deputy Chief of Staff, Systems and Logistics, Headquarters USAF, to the selected organization. Measurement for the award is based on:

The quality of performance and the value of the contribution to the Air Force logistics mission will be measured in part, as follows:

- a. Significance of the achievement, in terms of cost savings and/or manpower reduction.
- b. Applicability to other areas in the Air Force.
- c. Complexity or difficulty of the problem involved.
- d. Degree of initiative and originality employed in solving the problem.
- e. Examples of the development of a successful functioning concept, method, or procedure.¹²

¹²U.S., Department of the Air Force, Deputy for Systems and Logistics Award, AFR 400-22. (Washington: 3 March 1964).

The Daedalian Award: The Major General Clements McMullen Weapon System Maintenance Trophy, is presented annually to the U.S. Air Force unit (wing level), determined by the Chief of Staff, U.S. Air Force, to have attained the best weapon system maintenance record within the Air Force, for the preceeding year.¹³ Measurement for the award is based on numerous factors. However, each factor used is compared with similar factors from other organizations nominated for the award. The award is then presented to the organization attaining the highest degree of efficiency and effectiveness.

Incentives which are presently being used, for the most part, appear to be after-the-fact recognition for some contribution. This corresponds to the year-end bonus which is used in industry. The primary shortcoming of this form of incentive is that it is looked upon by many as a bonus or reward for achievement, and not as an inducement for efficiency.

The military structure, however, contributes to and provides for, its own motivation. This motivation may come about through promotion with its increase in pay, responsibility and authority, and with its increase in personal prestige.¹⁴ For some, this is sufficient--it provides the satisfaction to fill the desires which are strongest in the individual. Other individuals are satisfied by other stimuli, such as public recognition received for some contribution which was made to the organizational effort. This form of recognition singles out the individual from the group, a recognition that changes self-status. Each is satisfied to some degree by each form of recognition.

¹³U.S., Department of the Air Force, Daedalian Weapon Systems Maintenance Effectiveness and Efficiency Award, AFR 66-36. (Washington: 7 August 1953).

¹⁴The recognition and possession of authority is widely considered a matter of prestige, which in itself provides satisfaction for many. (David G. Hays, The Sociology of Management, The RAND Corporation Research Project P-1043, (Santa Monica, California: The RAND Corporation, 11 July 1957).

The Air Force programs reviewed are good programs. Although limited to the types of awards available for use, they do provide recognition to personnel who contribute to the attainment of greater efficiency within the maintenance program. However, industrial-type incentive programs using a base pay structure for meeting a production standard and additional increments of pay awarded for exceeding the standard, are not feasible for military application due to previously stated factors.

Summary

The comparison made between industrial and military incentive programs and environments reveals that overall objectives for each are not compatible. Industry operates to make a profit. As such its incentive programs are based on the ability to continue this profit. The nature of the type of industry determines the type of incentive which is applied. In a manufacturing process, individual work standards can be established and measured and an incentive can be based on the individual performance which exceeds the standard.

In the USAF maintenance program, standards cannot be readily established. This is due to the type of maintenance operations in which the USAF is engaged. It then becomes necessary to make comparisons between individuals, and this comparison is highly suspect as far as objectivity is concerned. Therefore, there is no known satisfactory means to accurately measure individual productive effort throughout the USAF maintenance organization. The program variables negate the close measurement necessary for the adoption of an industrial-type incentive plan based on individual work measurement.

CHAPTER IV

CONCLUSIONS

The efficient use of resources in the military structure presents a special problem due to the absence of built-in mechanisms such as found in the private sector of the economy. In the military, there is no competitive price mechanism which invites the search for greater economies. The increasing costs to operate the DoD during recent years would indicate that greater efficiency is needed if optimum benefits are to be achieved. The severity of these rising costs for operation of the DoD prompted Presidential action. This action resulted in two instructions being given to the Secretary of Defense:

1. Develop a force structure necessary to military requirements without regard to arbitrary budget ceilings.
2. Procure and operate this force at the lowest possible costs.

One of the actions taken to comply with the second Presidential instruction was to increase the use of incentive contracts with industry. The incentive contract provides for mutual gain for both the government and the contractor. The government benefits by obtaining the item at less cost and the contractor benefits by receiving greater profit. The contractor then, is rewarded for his efficiency.

The question to be resolved is, does the USAF organic aircraft maintenance program possess a similar environment to obtain greater efficiency through the use of personnel incentives?

Chapter II explored the industrial use of incentives and traced their

contemporary history, developed a concept and philosophy necessary for the implementation of an incentive program, and provided the background for incentive application within the USAF maintenance program.

Industry has introduced various programs to provide for worker motivation. Some plans have been more successful than others, some were developed for the worker, some for the supervisor, and still others for the manager or executive. Each plan had commonality of purpose and the hoped for effect to reduce costs and increase profits. Each plan recognized that extra effort expended in exceeding company standards should lead to some form of reward for the individual or group contributing to the objective attainment.

Standards for work measurement in a production process is the essential feature of an industrial incentive program. This is the general conclusion of most motivational researchers and industrial engineers making studies in the field of motivation and incentive application. Standards which are set by industry must be closely measureable and generally allow for a variation of 3% to 5% from the standard mean. This is the essence of a successful program for incentive application within industry. Individuals obtaining greater efficiency which leads to greater profits or reduced operating costs are rewarded for their efficiency.

In Chapter III, it was found that problems faced by the military manager concerning efficiency were no different than problems faced by his civilian counterparts in industry. When the military manager is relieved of the responsibility for defense, he becomes responsible for an industrial, commercial, wholesale, or retail operation.

The military manager cannot, however, be relieved of the responsibility for defense. There are times when he is confronted with situations not conducive to efficiency, such as unscheduled maintenance requiring the use of

resources for which there is no reimbursement, either budgeted or funded. The military manager, however, can be expected to meet his quantitative requirements. He can be expected to operate efficiently and where possible, reduce his costs.

In the USAF organic maintenance program, it was found that extreme variables are faced by the maintenance manager. These variables are both qualitative and quantitative. Each variable becomes a deciding factor in resource consumption, each variable negates the setting of standards comparable to industrial standards. Although standards have been set for the depot maintenance program, the 10% to 25% variation from the standard mean is not compatible with the 3% to 5% allowable variation found in industry. These variances are further magnified at the base level. Therefore, the measurement of individuals in the military program is usually subjective rather than objective. Subjective measurement does not provide the accuracy necessary to formulate an industrial-type incentive program based on individual work standards. The following synopsis allows the conclusions to be more succinctly stated:

1. The environment of the USAF maintenance program is such that it opposes the setting of standards which accurately measure individual productivity.
2. Incentives based on individual production are not feasible for use due to the high variation found in the maintenance program.
3. There are other means of providing incentives for either, or both, individual or group effort, to improve economies. These are:
 - a. Recognizing superior or outstanding performance through promotions, letters of commendation, commendation awards, outstanding efficiency reports, and other awards recognizing the individual.
 - b. Emphasizing the informal organization as a means of promoting

the organizational objectives. This immediately recognizes the informal organization as a group means to an end.

The following comparisons were made to arrive at the above conclusions:

Conditions Necessary for an Incentive Program Based on Individual Work Standards

	Industry		USAF Maintenance	
	Yes	No	Yes	No
1. Are incentives financial, non-financial, positive and negative, individual and group?	X		X	
2. Do incentive plans attempt to tie together high productivity and low production costs?	X		X	
3. Can standards be set which allow for little variation from the standard mean?	X			X
4. Can performance be measured against standards which have close tolerances?	X			X
5. Can individual performance be accurately measured on the basis of standard variation?	X			X
6. Can standards be set on the basis of repetitive work to be accomplished?	X			X
7. Can the basis for rewards and penalties be set once the standards have been developed?	X		X	
8. Are the production programs stable?	X			X
9. Is the use of incentives based on the ability to make a profit and/or to improve efficiency and effectiveness?	X		X	
10. Are environmental conditions the same?		X		X

Industrial-type incentives, using a base pay structure for meeting a production standard and additional increments of pay awarded for exceeding the standard, are not feasible for military application.

Other types of incentives are used in the USAF maintenance program. The extent of their use and efficiency is inconclusive. The concept and philosophy for the use of incentives, however, can be applied. Group

incentives should continue to be used as their purpose is recognition for superior or outstanding performance. Individual incentives presently in being should also continue to be used. Although they are considered to be, for the most part, subjective, they provide recognition to the superior or outstanding performer.

BIBLIOGRAPHY

Books

- Alford, Louis Pratt, and Beatty, H. Russell. Principles of Industrial Management, Revised Edition. New York: The Ronald Press Co. 1951.
- Anthony, Robert N. Management Accounting. Homewood, Illinois: Richard D. Irwin, Inc., 1960.
- Belcher, David W. Wage and Salary Administration. New York: Prentice-Hall, Inc., 1955.
- Bennett, Edward, and Degan, James, and Spiegel, Joseph. Human Factors in Technology. New York: McGraw-Hill Book Company, Inc., 1963.
- Brennan, Charles W. Wage Administration, Plans, Practices, and Principles. Homewood, Illinois: Richard D. Irwin, Inc., 1963.
- Davis, Ralph C. The Fundamentals of Top Management. New York: Harper & Brothers, 1951.
- Dean, Howard H., and Bryson, Kenneth D. Effective Communication. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1962.
- Drucker, Peter F. The Practice of Management. New York: Harper & Row, 1954.
- Good, Carter V. Introduction to Educational Research. New York: Appleton-Century-Crofts, 1963.
- Hitch, Charles J., and McKean, Roland N. The Economics of Defense in the Nuclear Age. Cambridge, Massachusetts: The Colonial Press for Harvard University Press, 1960.
- Miles, Lawrence D. Techniques of Value Analysis and Engineering. New York: McGraw-Hill Book Company, Inc., 1961.
- Roscoe, Edwin Scott. Organization for Production, an Introduction to Industrial Management. Homewood, Illinois: Richard D. Irwin, Inc., 1959.
- Scott, William G. Human Relations in Management, a Behavioral Science Approach. Homewood, Illinois: Richard D. Irwin, Inc., 1959.

Public Documents

U.S. Department of Defense. The Secretary of Defense, Memorandum for the President. Defense Department Cost Reduction Program. Washington, D.C. 5 July 1962.

U.S. Department of Defense. The Secretary of Defense, Memorandum for the President. Department of Defense Cost Reduction Program--First Annual Progress Report. Washington, D.C. 8 July 1963.

U.S. Department of Defense. Joint Meeting of Maintenance Reliability & Maintainability & Maintenance Reporting Programs Panels. Denver, Colorado, 14 August 1963.

U.S. Department of the Air Force. Maintenance Program Guidance. Washington, D.C. July 1963.

U.S. Department of the Air Force. Military Suggestion Program, AFR 35-12. Washington, D.C. 22 July 1960.

U.S. Department of the Air Force. Incentive Awards, AFR 40-470. Washington, D.C. 5 October 1962.

U.S. Department of the Air Force. Cash Awards For Suggesting an Invention, AFR 40-471. Washington, D.C. 15 September 1962.

U.S. Department of the Air Force. Cash Awards For Sustained Superior Performance and Special Acts or Services, AFR 40-472. Washington, D.C. 28 August 1962.

U.S. Department of the Air Force. Letters of Commendation or Appreciation, AFR 40-473. Washington, D.C. 31 July 1962.

U.S. Department of the Air Force. Service Recognition, AFR 40-474. Washington, D.C. 6 June 1962.

U.S. Department of the Air Force. Honorary Recognition, AFR 40-475. Washington, D.C. 18 September 1962.

U.S. Department of the Air Force. Non-Federal Awards, AFR 40-476. Washington, D.C. 12 July 1962.

U.S. Department of the Air Force. Deputy for Systems and Logistics Award, AFR 400-22. Washington, D.C. 3 March 1964.

U.S. Department of the Air Force. Daedalian Weapon Systems Maintenance Effectiveness and Efficiency Award, AFR 66-33. Washington, D.C. 7 August 1963.

U.S. Department of the Air Force. Air Force Cost Reduction Program, AFM 400-12. Washington, D.C. 28 February 1964.

U.S. Department of the Air Force. The Management Process, AFM 25-1. Washington, D.C. September 1954.

U.S. Department of the Air Force. Responsibilities of a Supervisor, AF Pamphlet 50-2-1. Washington, D.C. 1 June 1955.

U.S. Department of the Air Force, Air Force Logistics Command. Industrial Management, AFLC Regulation 66-31. Wright-Patterson AFB, Ohio, 2 February 1961.

U.S. Department of the Air Force, Air Force Logistics Command. Industrial Engineering Manual, AFLC Manual 66-4. Wright-Patterson AFB, Ohio, 30 September 1960.

U.S. Department of Defense, Office of the Assistant Secretary of Defense (Installations and Logistics). Incentive Contracting Guide. Washington, D.C. August 1962.

U.S. Executive Office of the President, Bureau of the Budget. Management Improvement in the Executive Branch, a Progress Report, Report 0-61-2. Washington, D.C. May 1961.

Articles and Periodicals

Borklund, C.W. "Installations and Logistics," Armed Forces Management. November 1963, 51-54.

Wagner, Joe. "We'll Save Money and thus Afford Better Weapon Systems," Armed Forces Management. February 1964, 21-23.

Whitman, Leroy. "Adm. Rickover says Military Influence Declines," Army Navy Air Force Journal and Register. 25 April 1964, 2.

Reports

Casey, William J., and Lasser, J.K. Executive Pay Plans, 1952-1953. Roslyn, New York: Business Reports, Inc., 1952.

National Industrial Conference Board, Inc. Compensation of Top Executives. Studies in Personnel Policy, No. 17A. New York: National Industrial Conference Board, Inc., 1959.

National Industrial Conference Board, Inc. Compensating First-Line Supervisors in Factory and Office. Studies in Personnel Policy, No. 177. New York: National Industrial Conference Board, Inc., 1960.

National Industrial Conference Board, Inc. Top Executive Compensation. Studies in Personnel Policy No. 179. New York: National Industrial Conference Board, Inc., 1960.

Other Sources

Air Force Logistics Command, Patterson AFB, Ohio. Personal Interview
during April 1964 with:

Mr. Harry Stiles, MCMEM, Industrial Engineer, Maintenance
Engineering Division.

Department of Defense, Washington, D.C. Personal Interview during April
1964 with:

Colonel John Ereehl, Secretary for the Equipment Maintenance
Readiness Council.

United States Air Force Headquarters, Washington, D.C. Personal Interview
during December 1963 and April 1964 with:

Mr. James B. Guthrie, AFSMEBA, Program Manager for P 431 funds,
Depot Maintenance, DCS/Systems and Logistics.

Mr. E.E. O'Rear, AFSME, Assistant for Maintenance Engineering,
DCS/Systems and Logistics.

This report represents the work of students of the School of Systems and Logistics. Material included in the report has been developed by the students as a portion of their educational program during attendance at the School.

These students have had considerable experience in various areas of military logistics. Consequently, the opportunity for them to concentrate this experience on the study of specific Air Force or Department of Defense current problems offers a potential not readily found elsewhere. The conclusions, and any recommendations, reached by the students may well be of significance for the military services. It is with this thought in mind that the individual studies are published.

From the school standpoint these studies are primarily an educational project; therefore, they should not be viewed by the reader as proposals or findings of the School of Systems and Logistics itself. The School's objectives are met through conduct of the research and preparation of the thesis; implementation is then up to the responsible agencies within the USAF or other services. You, the readers, are encouraged to give this report an objective appraisal to assess its applicability to current logistics problems.

This report is not to be disseminated nor reproduced in whole or in part without specific permission from the Dean, School of Systems and Logistics, Wright-Patterson AFB, Ohio, 45433.